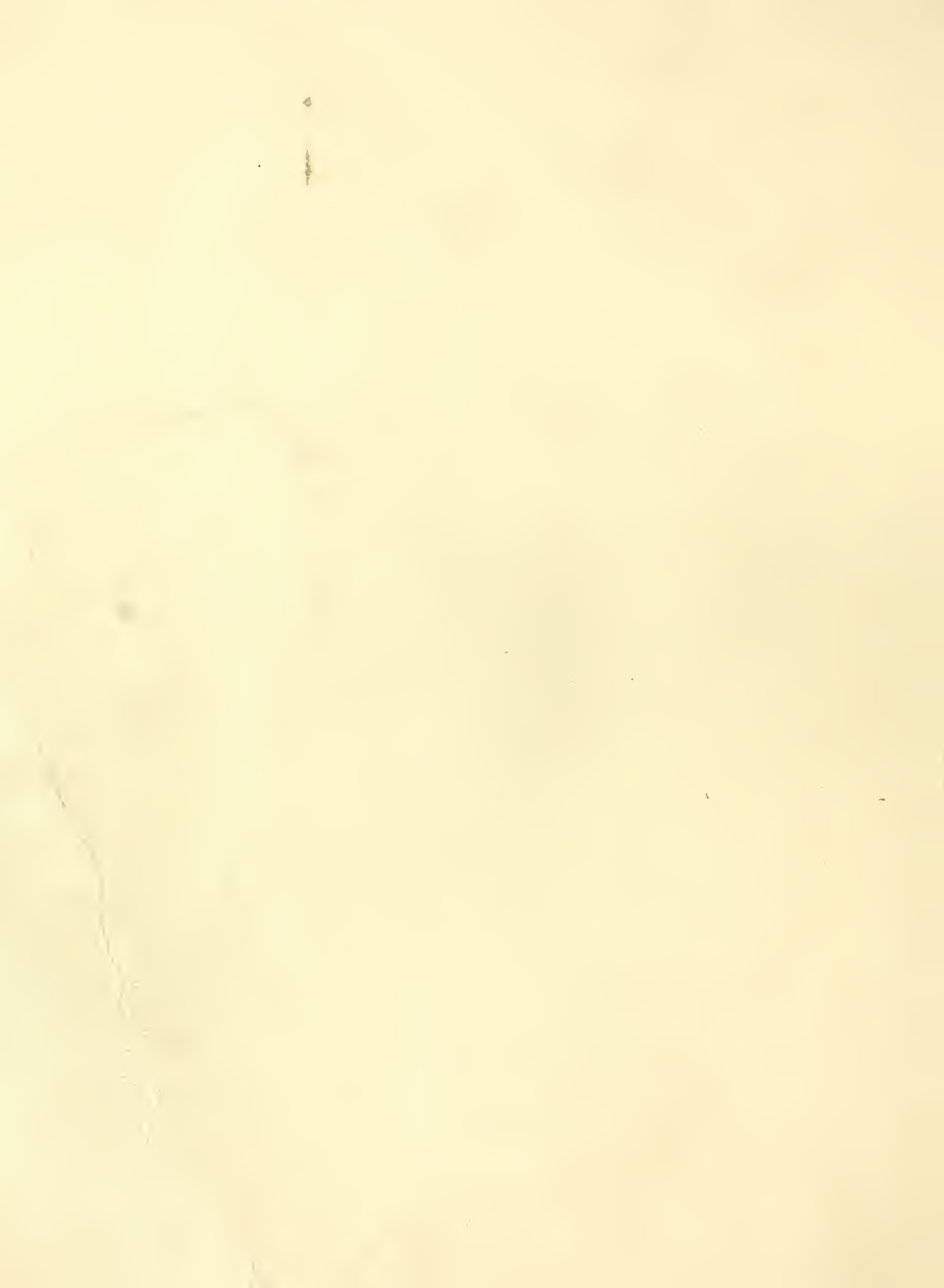


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New

1975 VIRUS TOLERANCE RATINGS FOR CORN STRAINS Grown in the Lower Corn Belt

In cooperation with
Missouri Agricultural Experiment Station
and
Ohio Agricultural Research and Development Center

ARS-NC-39
March 1976

PROCUREMENT SECTION
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Preface

To measure corn tolerance to natural virus infection by maize dwarf mosaic and maize chlorotic dwarf, breeders and researchers grew selected corn strains in test plots in lower parts of the Corn Belt. The results of these tests are given in this publication in two parts—corn strains grown in Missouri and those grown in Ohio.

Observers of the individual corn plants rated symptoms on a scale from 1 (no virus symptoms) to 9 (complete susceptibility). Infections varied in intensity between hybrids and inbreds. At all test locations, johnsongrass, an alternate host, was abundant near the plots. The rating variations within tests of inbreds and single cross and double cross hybrids are shown in tables in this publication.

Virus Tolerance Ratings for Corn Strains Grown in Missouri¹

M. S. Zuber, O. H. Calvert, A. J. Keaster and E. W. Palm²

This study identifies strains of corn planted in 1975 that exhibit tolerance to maize dwarf mosaic virus (MDMV) and maize chlorotic dwarf virus (MCDV) in areas of high virus infection. Selected corn strains planted at two Missouri locations were rated for MDMV and MCDV symptoms under conditions of natural infection. Test plots were located on the Bonacker farm near House Springs, Jefferson County, and at the Delta Center Experimental farm, Portageville, Pemiscot County.

Inbred lines, S₁ lines, single crosses, three-way and double crosses of corn were hand planted in single row plots consisting of 20 plants. Plants were spaced 1 foot apart. Each plot was replicated three times.

Planting at both locations was delayed until late May to encourage high levels of virus infection. Johnsongrass, an alternate host for the corn viruses involved in these ratings, was abundant in and near the test plots at both locations.

Virus ratings were made on two dates for the corn strains in the House Springs test. Ratings on the last date only are reported since there was no significant difference between dates. Ratings were made on only one date at the Delta Center. A second rating was not completed because of severe damage by the southwestern corn borer.

Virus Incidence

Maize dwarf mosaic virus (MDMV) and maize chlorotic dwarf virus (MCDV) were identified by plant symptoms at both locations. MDMV gives a typical mosaic pattern, whereas MCDV shows vein clearing on the infected leaves. Both viruses have johnsongrass as an alternate host. The corn leaf

aphid, *Aphis maidis*, and possibly other aphids, transmits MDMV from infected johnsongrass to corn. The leafhopper, *Graminella nigrifrons*, is the vector for MCDV. MDMV can be transmitted mechanically, MCDV can not.

Each plant within a single-row plot was rated for virus symptoms on a 1 to 9 severity scale, with a rating of 9 as most severe. The ratings were made mainly for severity and not for specific types of virus. The plot mean was the average of the individual plant ratings. For each entry, the three replications were averaged to obtain the final rating.

As in 1974, MCDV was the predominant virus at both locations. The 1975 average virus ratings at House Springs were slightly lower than in previous years (table 1.) However, the virus infection level was adequate for identifying strains with or without tolerance. At the Delta Center, the average ratings were about the same as in 1974 but may have been higher if a second rating had been made. The more vigorous hybrids showed fewer virus symptoms than any of the less vigorous, inbred lines.

In general, higher incidence of virus symptoms in field corn was reported from many areas of the state. The increase in incidence may have been associated with higher stress during July and

Table 1.—Comparative virus ratings¹ for a susceptible and a tolerant single cross to virus infections, for 8 years at two locations

Single cross	1968	1969	1970	1971	1972	1973	1974	1975	Aver- age
Jefferson County:									
Mo5×H55	8.00	8.20	7.30	7.60	7.00	7.00	8.20	7.50	7.60
Mo14W×Oh7B	1.67	5.81	4.00	4.70	2.33	1.30	3.60	1.70	3.14
Pemiscot County:									
Mo5×H55	4.67	6.33	5.33	7.00	3.67	7.00	3.70	4.50	5.28
Mo14W×Oh7B	1.35	1.00	1.70	1.00	1.00	2.30	1.70	1.20	1.41

¹Rating scale from 1 (no symptoms) to 9 (plant killed by virus).

¹Cooperative investigation between Agricultural Research Service, U. S. Department of Agriculture and the University of Missouri Agricultural Experiment Station, Columbia, Mo. Series Number 7457.

²Research agronomist, ARS-USDA, and professor of agronomy; professor of plant pathology; associate professor of entomology; and associate professor of plant pathology. University of Missouri, Columbia.

August as the result of above average temperatures and below average rainfall.

Commercial Hybrids

Virus ratings were made on 86 commercial hybrids and two check hybrids at the Delta Center (table 2, exp. V-8) and House Springs (table 3, exp. V-9). At the Delta Center no significant differences showed among 77 hybrids of the 88 tested. A low virus infection at the Delta Center permitted identification of only a few, highly susceptible hybrids; results at House Springs showed no significant difference for virus ratings for 46 of the 88 hybrids.

The lack of significant differences in virus ratings between the majority of hybrids indicated increased resistance among the new commercial hybrids.

Uniform Test of Inbred Lines

A uniform inbred evaluation test sponsored by the North Central Corn Breeding Research Committee included 49 inbred lines plus 11 inbred line checks. These 60 inbred lines were rated for virus symptoms at the Delta Center (table 4, exp. V-12). Eight of the 60 had significantly better ratings than the other 52 tested. These included N142, Mich 75-1, the Oh7B check, Mo Syn A High S₄ (2) 74:1227, B79, N152, B77, and ND71-60.

The virus test sponsored by the Southern Corn Improvement Conference was grown and rated for virus symptoms at the Delta Center (table 5, exp. V-15). Several new experimental inbred lines appear worthy of additional testing. All were rated below that of the check inbred line Mo5, but the final 16 entries were as good as the tolerant check inbred line Oh7B.

Conclusions

Corn strains with severe virus symptoms were greater in 1975 than at any time in the past 3 years. A potential virus problem exists wherever johnsongrass grows; therefore, growers should select hybrids with the highest level of virus tolerance. In the test's results reported here, several hybrids had high levels of tolerance that should be suitable for planting in virus problem areas.

In general, corn breeders have been quite successful in developing new hybrids with high tolerance. During the past 5 years, the number of commercial hybrids with high levels of tolerance has increased.

Table 2.—1975 virus ratings for commercial and two hybrid checks grown at the Delta Center near Portageville in Pemiscot County, Mo., planted May 28 and rated July 29. Experiment V-8

Hybrid	Virus ratings	Duncan's
Ky226 x FR805W	1.0	
PAC 22354	1.0	
Cargill 236034	1.0	
Trojan X124	1.0	
Ky226 x FR802W	1.0	
McCurdy 7474	1.0	
Columbiana H4728	1.0	
Punks G-26622	1.0	
DeKalb XL728	1.0	
Punks G-4525	1.0	
Northrup King FXT37	1.0	
Punks G-26543	1.0	
FR154 x Oh514	1.0	
FFR 2283	1.1	
Northrup King X1923	1.1	
Trojan X354	1.1	
Punks G-26637	1.1	
McHair 73011	1.1	
PAG 125053	1.1	
Trojan X142	1.1	
Pioneer 3347	1.1	
(T224 x T232)(Va35 x FR13)	1.1	
(T224 x T232)(FRN28 x FR2A)	1.1	
DeKalb X304	1.1	
Trojan X332	1.2	
(T224 x T232)(FRN28 x FR4A)	1.2	
Pioneer 3147	1.2	
McHair Expt 3049	1.2	
IPSI 75-101	1.2	
FR2A x FR15A)Mo17	1.2	
(Mo1W x FR802W)FR805W	1.2	
Oh7B x Mo1W	1.2	
McCurdy 17514	1.2	
Columbiana H2626	1.3	
FR13A x FR15A	1.3	
McHair 508A	1.3	
IPSI 75-102	1.3	
Cargill 125154	1.3	
DeKalb XL394	1.3	
Pioneer 3177	1.3	
Pioneer 3145	1.3	
IPSI 75-103	1.3	
Moews M303W	1.4	
[(C166 x K55)(C166)FR805W	1.4	
FR13 x FR15A	1.4	
(FR13 x FR13A)Oh514	1.4	
(FR15 x FR15A)Mo17	1.5	
McHair X233	1.5	
Hulting X980	1.5	
FR805W x Mo20W	1.5	
Hulting X73649	1.5	
Ky216 x FR805W	1.5	
Bear 850	1.6	
Northrup King FX91	1.6	
BoJac X69	1.6	
Columbiana H2750	1.6	
Northrup King X1922	1.6	
McCurdy 4804	1.7	
Moews M321W	1.7	
(FR15 x FR15A)Va26 ^{HC}	1.8	
DeKalb XL75	1.8	
BoJac X36	1.8	
McCurdy M5X85	1.8	
IPSI 74-105	1.9	
NC ⁵⁹	1.9	
RA 150	1.9	
Columbiana H2740	1.9	
(C166 x Ky228)FR802W	2.0	
(FR15 x FR15A)(Mo17 x FR13)	2.0	
Hulting X8500	2.0	
NC ⁸⁵	2.1	
Hulting X9880	2.1	
Bear 810	2.2	
(FR37 x H84)Oh551	2.2	
Coker 77	2.3	
Bear 2678	2.3	
NC ⁶¹	2.3	
ACCO AR41619	2.4	
NC ⁵⁷	2.4	
Bear 7444	2.5	
ACCO UC9451	2.6	
ACCO AR20657	2.6	
Co-op 2300F4	2.8	
ACCO AR41594	3.0	
Co-op 3300F2	3.1	
BoJac X56	3.4	
BoJac X52A	4.2	
H55 x Mo5 ²	4.5	
Coefficient of variation	percent 11.4	
Least significant difference	1.08	

¹Duncan's Multiple Range Test—Entries with the same line in common are not considered significantly different at the 5% level.
²Check hybrids.

Table 3.—1975 virus ratings for commercial plus two check hybrids grown on the Bonacker farm near House Springs in Jefferson County, Mo., planted May 21 and rated August 21. Experiment V-9

Hybrid	Virus Rating ¹	D ₉₉ ²
Funks G-26622	1.2	
DeKalb EX94	1.5	
FFR 2283	1.5	
PAG 22354	1.5	
Northrup King X1923	1.5	
FR805W x Mo20W	1.5	
Funks G-4525	1.5	
Cargill 125154	1.6	
Columbiana H4728	1.6	
McHair X233	1.6	
Pioneer 3147	1.6	
Trojan X142	1.7	
Ky226 x FR802W	1.7	
OhTB x Mo144 ²	1.7	
Funks G-26543	1.7	
McCurdy 17514	1.7	
DeKalb XL394	1.8	
Ky226 x FR805W	1.8	
Cargill 236034	1.8	
Moews M303W	1.9	
Ky216 x FR805W	1.9	
Northrup King PXT37	1.9	
McHair Expt3049	1.9	
McHair 508A	1.9	
Pioneer 3347	1.9	
Trojan X3524	2.0	
DeKalb XL728	2.0	
Trojan X3382	2.0	
McCurdy 7474	2.0	
FR13A x FR15A	2.0	
Pioneer 3145	2.1	
IPSI 75-103	2.1	
Northrup King X1922	2.1	
Trojan X124	2.1	
Pioneer 3177	2.2	
IPSI 74-105	2.3	
Funks G-26637	2.3	
McHair 73011	2.3	
(FR2A x FR15A)Mo17	2.3	
Columbiana H2740	2.4	
BoJac X69	2.4	
PAG 125053	2.4	
IPSI 75-102	2.4	
(T224 x T232)(Va35 x FR13)	2.5	
FR15A x Oh514	2.6	
(T224 x T232)(FR828 x FR2A)	2.6	
(T224 x T232)(FR828 x FR4A)	2.8	
(Mo14 x FR802W)FR805W	2.8	
IPSI 75-101	2.9	
(FR13 x FR13A)Oh514	2.9	
[(CI66 x K55)CI66]FR805W	2.9	
Northrup King PK91	2.9	
Columbiana H2626	2.9	
(FR15 x FR15A)(Mo17 x FR13)	3.0	
(FR15 x FR15A)Mo17	3.0	
(CI66 x Ky228)FR802W	3.0	
McCurdy M2X85	3.1	
Bear T444	3.2	
McCurdy 4804	3.2	
Bear TG78	3.2	
NC*57	3.3	
DeKalb XL75	3.4	
Multine X980	3.5	
Bear 850	3.6	
Multine XT3649	3.6	
Moews SM221W	3.8	
ACCO AR41619	3.8	
RA150	3.9	
Coker 77	3.9	
Columbiana H2750	3.9	
BoJac X36	4.0	
(FR15 x FR15A)Va26T4	4.0	
FR13 x FR15A	4.1	
(FR37 x H84)Oh551	4.1	
BoJac X56	4.3	
NC*85	4.3	
Multine X8800	4.3	
Multine X9880	4.4	
Co-op 2300F4	4.5	
ACCO AR41594	4.6	
NC*61	4.7	
ACCO AR20657	4.9	
Co-op 3300F2	5.3	
BoJac X52A	5.3	
Bear 810	5.5	
ACCO UC9451	5.9	
NC*59	5.9	
H55 x Mo5 2/	7.5	
Coefficient of variation	percent 24.3	
Least significant difference	1.13	

¹Duncan's Multiple Range Test—Entries with the same line in common are not considered significantly different at the 5% level.
²Check hybrids.

Table 4.—1975 virus ratings for inbred lines in the Uniform Evaluation, North Central Corn Breeding Research Committee (NCR-2) grown at the Delta Center near Portageville in Pemiscot County, Mo., planted May 28 and rated July 29. Experiment V-12

Inbred line	Virus ratings	DMFT ¹
N142	3.0	
Mich. 75-1	3.4	
Oh7B Check	3.4	
(Syn A High)S ₄ (2)74:1227	3.6	
B79	4.6	
N152	4.8	
B77	4.8	
ND71-60	4.8	
N139	5.1	
Ms93	5.2	
Oh516	5.3	
AT1-32	5.4	
AT3-3	5.4	
W117 Check	5.6	
Oh561	5.6	
Oh72-588	5.7	
B37 Check	5.8	
R14 Check	5.8	
Mo14W Check	5.9	
AT1-35	5.9	
(Syn B High)S ₄ (3)74:1301	6.0	
AT3-2	6.1	
AT3-1	6.2	
Mich. 75-4	6.2	
W64A Check	6.2	
(Syn B High)S ₄ (2)74:1285	6.2	
N162	6.3	
N132	6.3	
H99	6.3	
Mo5	6.3	
Ia74:1159	6.4	
Ms73	6.4	
Ia74:1128	6.4	
B75	6.4	
Mich. 75-3	6.4	
Ia74:1114	6.4	
B78	6.6	
Oh517	6.6	
(Syn A High)S ₄ (3)74:1251	6.6	
Ms200	6.7	
W153R Check	6.7	
Ia74:1129	6.7	
ND71-36	6.7	
Ia74:1139	6.8	
B73	6.9	
H100	6.9	
Oh563	7.0	
Mich. 75-2	7.0	
Oh567	7.1	
(Syn A High)S ₄ (1)74:1255	7.1	
Oh51A Check	7.2	
Oh43 Check	7.3	
(Syn B High)S ₄ (1)74:1275	7.3	
ND71-61	7.4	
W59 Check	7.5	
ND71-41	7.5	
Oh562	7.8	
Oh565	8.0	
ND71-53	8.3	
H55 Check	8.8	
Coefficient of variation		percent 16.9
Least significant difference		1.70

¹Duncan's Multiple Range Test—Entries with the same line in common are not considered significantly different at the 5% level.

Table 5.—1975 virus ratings for inbred lines in the open-end test sponsored by the Southern Corn Improvement Conference grown at the Delta Center near Portageville in Pemis-
cot County, Mo., planted May 28 and rated July 29. Experiment V-15

Inbred line	Virus ratings	DMRT ¹
AA8sh ₂ 3884	1.9	
SH62	2.3	
Lt538	2.4	
MN 3	2.5	
HL562	2.6	
Oh513	2.7	
SC473	2.8	
Ark 37325	2.9	
Lt531	2.9	
Mp73:32	3.1	
T143	3.2	
CM104f	3.2	
Mp72:299	3.3	
Lt636	3.3	
Oh7B ^{2/}	3.3	
Ark 32559	3.3	
MN 2	3.5	
MN 1	3.5	
SC13R	3.5	
T232	3.7	
Lt542	3.7	
MN 6	3.7	
Ga209	3.7	
Tx601	3.7	
Tx5855	3.8	
SC235	3.8	
T(CM105)	3.8	
SC213	3.8	
Mp71:209	3.8	
SC13	3.8	
L108	3.9	
SC460	4.0	
(Mp339 x Tx601)S ₃ 74:2635	4.0	
(Mo14W x Oh7B)S ₅ (w)74:2559	4.0	
L42sh ₂ 1400	4.0	
(Ga209 x Mp412)S ₃ 74:2608	4.0	
Ga222	4.2	
(Ga209 x Tx601)S ₃ 74:2619	4.2	
MN ⁴	4.3	
T240	4.5	
SC299	4.7	
(Mp339 x Mp412)S ₃ 74:2625	4.8	
AA8-163su	4.8	
Tx6252-46	4.9	
Ga203	4.9	
Mp490	4.9	
L605	5.0	
(Mo14W ² x Oh7B)S ₅ (y)74:2566	5.1	
Mo14W ^{2/}	5.1	
MN 5	5.2	
Mo17C	5.3	
Oh72-588	5.4	
Ark346 SWCB	5.5	
Ark 33530	5.6	
Mp71:205	6.2	
Mo5 ^{2/}	7.3	
Coefficient of variation	percent 23.6	
Least significant difference	1.52	

¹Duncan's Multiple Range Test--Entries with the same line in common are not considered significantly different at the 5% level.
²Check inbred lines.

Virus Tolerance Ratings of Corn Inbred Lines Grown in Ohio³

W. R. Findley, J. K. Knoke, Raymond Louie, and E. J. Dollinger¹

Corn inbred lines rated for virus diseases as a result of natural infection were grown on the Jim Daulton farm in the Ohio River Valley near Portsmouth, Ohio.

The ratings reported here were from tests sponsored by the Ohio Agricultural Research and Development Center, North Central Corn Breeding Research Committee, and Southern Corn Improvement Conference.

On May 22, 1975, 25 seeds were single-space planted in one-row plots, 18 feet long and replicated twice. Aisles were 4 feet wide and rows were 36 inches apart.

Seedling emergence generally was good resulting in satisfactory stands in most plots. Weather conditions in June were favorable, but during July and August many daytime temperatures exceeded the optimum for corn growth. Below-normal precipitation during the last 3 weeks in July resulted in increasing stress on the plants.

Virus Incidence

Virus diseases such as maize dwarf mosaic (MDM) and maize chlorotic dwarf (MCD) probably have occurred in southern Ohio for several years, although MCD was not identified as part of the disease complex until 1972. Both viruses overwinter in johnsongrass and become a problem where the grass occurs in abundance.

MDM and MCD were present in the test plots throughout the season but their incidences were relatively low and not uniform. Test plots were located along the south side of a johnsongrass field from which a decreasing virus disease gradient occurred. Virus infection in mid-July in a planting of WF9×Oh51A ranged from 85 percent MDM

and 75 percent MCD in the row next to the johnsongrass to 31 percent and 13 percent, respectively, 28 rows away. Later in the season the gradient decreased somewhat. MDMV-B, the non-johnsongrass strain, occurred in very low incidence.

Table 6.—Incidence of maize dwarf mosaic (MDM) on inbred lines in the Ohio Agricultural Research and Development Center test on August 21, 1975

Inbred	MDM %	DMRT ^{1/}
GT3	0	
Ky61-2335	0	
Mo12	0	
N6J	0	
Oh7B	0	
Pa405	0	
CI.44	0	
T232	0	
Mo20W	0	
Oh509	0	
Oh513	0	
Oh514	0	
Oh41	0	
N78	0	
Oh07	2.7	
Ky128	3.1	
Ky66-2500	3.1	
Ky135	3.8	
A	4.5	
PaB84P	4.6	
814	5.0	
A375	5.5	
Oh509A	5.9	
Oh7K	6.2	
Mo1BW	6.6	
K44	7.5	
Tx601	8.3	
GA209	9.2	
Va35	9.2	
N6	9.9	
Ia65-1269	10.8	
A73	11.1	
E-38-11-11-5	11.1	
CI.388	11.9	
Oh512	12.5	
CG1	13.1	
A239	13.7	
K61-1	13.9	
E14-2-9	14.9	
Oh7N	15.2	
CI.21E	16.6	
Oh45	17.0	
GT112	18.8	
H55	21.4	
33-16	22.2	
Ky226	25.3	
837	26.9	
Oh422	27.1	
ML4	27.2	
Mo5	31.5	
Oh72-588	31.7	
JSAS2-2	31.9	
Pa32	32.5	
CI03	38.3	
N20	48.7	
Oh43	50.0	
869	52.4	
K150	64.7	
B54	70.0	
Coefficient of variation	102.4	
Least significant difference	30.2	

^{1/} Duncan's Multiple Range Test - Entries with the same line in common are not considered significantly different at the 5% level.

³Cooperative investigations of the Agricultural Research Service, U.S. Department of Agriculture and the Ohio Agricultural Research and Development Center, Wooster, Ohio.

⁴Research agronomist, Research Entomologist, and research plant pathologist, Agr. Res. Ser., U.S. Dept. of Agr.; and professor of agronomy, Ohio Agr. Res. and Dev. Ctr., Wooster, Ohio.

Table 7.—Incidence of maize chlorotic (MCD) on inbred lines in the Ohio Agricultural Research and Development Center test on August 21, 1975

Inbred	MCD %	DMRT ^{1/}
CI.44	0	
N6J	5.5	
Mo12	7.1	
Mo20W	7.1	
Pa405	11.1	
Oh7B	12.5	
Oh514	13.9	
N7B	17.1	
Ky12B	18.4	
Oh509	21.0	
A375	21.1	
Oh7K	25.0	
Tx601	25.5	
Ky61-2335	26.5	
CI03	26.6	
T232	28.2	
A239	29.5	
PaBB4P	31.6	
Oh513	32.7	
JSA52-2	33.0	
GA209	36.0	
33-16	36.1	
Oh512	37.5	
Oh509A	38.6	
Mo18W	39.6	
Oh07	41.1	
Oh72-SBB	46.3	
K61-1	48.0	
Ky66-2500	48.5	
E3B-11-11-5	50.0	
GT3	50.3	
Ia65-1269	52.5	
Oh45	54.0	
CI.3BB	54.0	
A73	54.6	
N6	55.9	
B54	58.5	
CG1	60.2	
M14	65.0	
B14	67.5	
Oh41	67.8	
Ky135	69.2	
GT112	71.1	
A	72.1	
B37	72.4	
Oh43	75.0	
K150	75.6	
Pa32	76.6	
Va35	78.1	
K44	79.1	
Oh7N	79.2	
CI.21E	80.8	
B69	88.8	
E14-2-9	90.7	
Ky226	90.9	
Mo5	91.1	
Oh422	100.0	
N20	100.0	
H55	100.0	
Coefficient of variation	41.2	
Least Significant difference	41.9	

^{1/} Duncan's Multiple Range Test - Entries with the same line in common are not considered significantly different at the 5% level.

Symptoms of MDM were chlorotic patterns of mosaic, ring, fleck, mottle, and streak, primarily on the youngest leaves.

The diagnostic symptom for MCD was chlorotic streaking in the smallest (tertiary) leaf veins. Severe symptoms of one disease often masked symptoms of the other.

Virus-infected plants in the tables included dead plants, in addition to those MDM- and MCD-infected. The former were considered killed by virus.

Inbred Line Evaluation

Data on Ohio Agricultural Research and Development Center inbred line entries are in tables 6, 7, and 8. Entry mean squares were highly significant for MDM-, MCD-, and virus-infected (MDM+MCD+dead) plants. Nonsignificant ranges at the 5 percent probability level were 0 to 32.5 percent, 0 to 50.3 percent, and 0 to 40.3 percent for MDM-, MCD-, and virus-infected plants, respectively.

Table 8.—Virus infected plants of inbred lines in the Ohio Agricultural Research and Development Center test on August 21, 1975

Inbred	Virus ^{1/} infected %	DMRT ^{2/}
CI.44	0	
N6J	5.5	
Mo12	7.1	
Mo20W	7.1	
Oh7B	12.5	
Pa405	13.1	
Oh514	13.9	
A375	15.5	
N7B	17.1	
Ky12B	18.4	
Oh509	21.0	
Ky61-2335	26.4	
T232	28.2	
Tx601	28.5	
Oh7K	31.2	
Oh513	32.7	
PaBB4P	35.2	
GA209	40.3	
Oh07	44.4	
Oh509A	44.5	
Oh512	45.4	
Mo18W	46.2	
33-16	47.2	
A239	47.6	
GT3	50.3	
N6	50.3	
Ky135	51.1	
Ky66-2500	51.6	
JSA52-2	57.0	
K61-1	58.1	
CI.3BB	61.2	
CI03	61.6	
Oh72-SBB	62.5	
A73	62.6	
Ia65-1269	66.2	
Oh41	70.2	
Oh43	75.0	
B37	75.3	
B14	76.3	
CG1	77.0	
GT112	78.0	
Oh7N	83.7	
K44	84.1	
Va35	85.3	
A	86.2	
M14	88.2	
B69	89.8	
Ky226	90.9	
CI.21E	91.9	
Oh45	96.4	
K150	96.8	
B54	97.0	
E14-2-9	97.3	
Oh422	100.0	
Pa32	100.0	
E3B-11-11-5	100.0	
N20	100.0	
Mo5	100.0	
H55	100.0	
Coefficient of variation	30.5	
Least significant difference	35.2	

^{1/} Includes dead plants, which were considered killed by virus.

^{2/} Duncan's Multiple Range Test - Entries with the same line in common are not considered significantly different at the 5% level.

Table 9.—Incidence of maize dwarf mosaic (MDM) on inbred lines in the North Central Corn Breeding Research Committee uniform test on August 25, 1975

Inbred	MDM %	DMRT ^{1/}
Oh78	0	
A73-2	0	
Mich. 75-1	0	
N132	0	
N139	0	
N142	0	
N162	0	
Oh516	2.9	
Oh72-588	3.1	
Mich. 75-2	3.1	
878	3.7	
(Syn 8 High)S ₄ (2)	3.8	
(Syn 8 High)S ₄ (1)	4.1	
Oh562	5.0	
WF9	5.5	
Ms93	5.5	
H55	6.2	
Oh51A	6.5	
A73-3	7.1	
(Syn A High)S ₄ (2)	7.5	
A73-1	7.6	
814	8.3	
879	8.3	
A71-35	11.1	
Mich. 75-3	11.7	
W117	12.5	
875	12.9	
Oh563	13.3	
Ia74:1129	13.6	
Mich. 75-4	14.2	
Oh517	16.4	
H99	16.6	
837	17.0	
Ia74:1139	18.8	
W64A	20.5	
Oh565	21.7	
N152	22.6	
(Syn 8 High)S ₄ (3)	24.2	
Oh567	24.7	
877	26.2	
(Syn A High)S ₄ (3)	27.7	
Ms73	27.8	
(Syn A High)S ₄ (1)	28.5	
Ms200	29.1	
Oh43	29.8	
Ia74:1114	35.7	
Oh561	38.6	
H100	48.1	
W153R	50.0	
A71-32	50.0	
873	50.0	
Ia74:1159	74.2	
Ia74:1128	81.2	
Coefficient of variation	127.2	

^{1/} Duncan's Multiple Range Test - Entries with the same line in common are not considered significantly different at the 5% level.

Mean percentages of infected plants that exceed the indicated ranges are significant, except there is no difference between two means that are both contained in another array of means with a non-significant range.

Most of the lines were tested in 1974. Average percentages of infected plants in these lines in 1974 and 1975 were 40.0 and 14.7 for MDM and 85.4 and 48.5 for MCD. Among the top-ranked 15 lines in both years for MDM tolerance were, GT3, Pa405, CI.44, T232, Mo20W, Oh509, and Oh513; and for MCD tolerance, Mo12, CI.44, C103, N6J, Mo20W, Oh7B, and Oh7K.

Data on inbred lines in the uniform test sponsored by the North Central Corn Breeding Re-

search Committee appear in tables 9, 10, and 11. Sixteen lines were common in 1974 and 1975 tests. Average virus infection in 1974 and 1975 was 41.8 and 13.5 percent for MDM and 92.4 and 39.9 percent for MCD. Entry mean squares were not significantly different for MDM. However, they were significantly different at the 5 percent and 1 percent probability level for MCD- and virus-infected plants. Nonsignificant ranges of percentages of infected plants at the 5 percent level were for MCD 5.0 to 58.8 percent and for virus-infected plants 18.1 to 72.7 percent.

Incidence of MDM and MCD in lines included in the uniform test sponsored by the Southern Corn

Table 10.—Incidence of maize chlorotic dwarf (MCD) on inbred lines in the North Central Corn Breeding Research Committee uniform test on August 25, 1975.

Inbred	MCD %	DMRT ^{1/}
W153R	5.0	
877	6.2	
Ia74:1128	6.2	
Ms73	6.2	
Mich. 75-4	11.8	
W64A	12.2	
Ia74:1114	13.3	
Oh517	15.9	
Ms93	16.6	
Mich. 75-1	18.1	
A73-2	18.8	
(Syn 8 High)S ₄ (2)	20.6	
879	22.2	
H99	23.8	
814	25.0	
Ia74:1159	25.0	
N142	25.5	
B78	27.1	
Oh561	27.1	
875	27.6	
Mich. 75-3	27.9	
Oh51A	28.3	
Oh78	30.7	
H100	31.8	
N152	32.9	
A71-32	33.3	
N139	35.0	
(Syn 8 High)S ₄ (1)	36.3	
Ia74:1129	36.7	
(Syn A High)S ₄ (2)	36.7	
W117	37.5	
A71-35	38.9	
(Syn A High)S ₄ (3)	38.9	
Oh567	41.0	
N132	42.9	
Oh563	46.6	
(Syn 8 High)S ₄ (3)	46.7	
WF9	47.9	
Ms200	48.3	
Mich. 75-2	48.9	
Oh72-588	51.3	
837	54.1	
A73-1	58.8	
Oh565	58.8	
A73-3	61.9	
Oh43	63.8	
Oh516	66.2	
N162	67.1	
(Syn A High)S ₄ (1)	67.9	
H55	71.0	
Oh562	76.1	
Ia74:1139	76.9	
873	100.0	
Coefficient of variation	61.4	
Least significant difference	46.5	

^{1/} Duncan's Multiple Range Test - Entries with the same line in common are not considered significantly different at the 5% level.

Improvement Conference are reported in tables 12 and 13. Entry mean squares were highly significant for both variables. Nonsignificant ranges at the 5 percent probability level were for MDM 0 to 35.4 percent and for MCD 2.8 to 48.6 percent.

Variability associated with data in these tests and the correspondingly high standard errors makes selection of superior inbred lines difficult if not impossible.

Table 11.—Virus infected plants of inbred lines in the North Central Corn Breeding Research Committee uniform test on August 25, 1975

Inbred	Virus ^{1/} infected	DMRT ^{2/}
Mich.75-1	18.1	
N142	29.6	
Oh78	30.7	
(Syn 8 High)S ₄ (2)	30.9	
Oh517	32.2	
B78	32.7	
814	35.3	
Mich.75-4	34.0	
B79	35.5	
N139	36.4	
B77	36.6	
Mich.75-2	41.9	
Oh51A	42.7	
W117	42.8	
N132	45.9	
(Syn A High)S ₄ (2)	46.7	
875	47.2	
A73-2	48.2	
Ms93	48.9	
(Syn B High)S ₄ (1)	50.0	
H99	54.1	
Oh561	55.0	
N152	57.5	
W64A	57.7	
(Syn B High)S ₄ (3)	58.9	
Ia74:1129	59.1	
Oh565	60.0	
Ms73	60.2	
Oh72-588	60.4	
(Syn A High)S ₄ (3)	61.2	
Mich.75-3	61.5	
Oh563	61.7	
Ia74:1114	63.5	
Oh567	66.2	
B37	68.3	
Oh516	68.6	
WF9	69.2	
N162	71.4	
A71-35	72.7	
H100	75.3	
A73-1	76.4	
Oh43	78.3	
W153R	79.5	
A73-3	80.9	
(Syn A High)S ₄ (1)	81.7	
Ia74:1139	82.0	
Ia74:1128	85.0	
H55	85.3	
Oh562	85.8	
Ms200	88.9	
Ia74:1159	91.6	
A71-32	94.1	
B73	100.0	
ND71-36	100.0	
ND71-41	100.0	
ND71-60	100.0	
ND71-61	100.0	
Coefficient of variation	34.8	
Least significant difference	44.5	

^{1/} Includes dead plants, which were considered killed by virus.

^{2/} Duncan's Multiple Range Test - Entries with the same line in common are not considered significantly different at the 5% level.

Table 12.—Incidence of maize dwarf mosaic (MDM) on inbred lines in the Southern Corn Improvement Conference uniform test on August 22, 1975

Inbred	MDM	DMRT ^{1/}
(Mo14wxOh78)S ₄	0.0	
Ark. 32559	0.0	
LT542	0.0	
LT531	0.0	
GA209	0.0	
Mp71:205	0.0	
Mp71:209	0.0	
T(CM105)	2.6	
Mp73:32	2.6	
T143	3.1	
Oh513	3.1	
(Mp339xTx601)S ₃	5.0	
T232	6.5	
LT636	7.1	
LT538	11.1	
T240	11.1	
(GA209xMp412)S ₃	11.3	
Mp72:299	12.5	
Oh72-588	13.3	
SC13R	14.6	
Ark. 33530	16.6	
LI08	17.6	
(Mp339xMp412)S ₃	18.9	
(GA209xTx601)S ₃	20.0	
Ark. 346 SWC8	20.0	
SC460	21.4	
L605	22.2	
Tx601	22.7	
CI. 90C	23.3	
Ab28A	25.0	
GA222	25.2	
SC213	25.8	
Tx5855	25.9	
GA203	26.3	
(Mo14wxOh78)S ₅	26.4	
Mo17C	28.7	
SC473	30.0	
SC13	31.8	
Ark. 37325	35.4	
Tx6256-46	37.1	
SC235	43.3	
Mp490	66.1	
SC229	66.4	
Coefficient of variation	83.1	
Least significant difference	30.5	

Table 13.—Incidence of maize chlorotic dwarf (MCD) on inbred lines in the Southern Corn Improvement Conference uniform test on August 22, 1975

Inbred	MCD	DMRT ^{1/}
T(CM105)	2.8	
Mp71:205	5.0	
Mo17C	13.3	
GA209	14.3	
Mp71:209	17.4	
Ark. 37325	17.5	
Ark. 32559	18.2	
SC213	21.3	
LT531	23.7	
T143	28.1	
Oh72-588	29.3	
(Mo14wxOh78)S ₄	29.4	
(GA209xMp412)S ₃	34.5	
SC229	34.7	
(Mo14wxOh78)S ₅	35.2	
Oh513	36.1	
Ab28A	36.3	
GA222	38.6	
Ark. 33530	39.1	
LT538	41.3	
SC235	42.9	
T232	43.0	
Mp72:299	43.8	
(Mp339xMp412)S ₃	44.8	
LI08	47.2	
L605	48.6	
Tx6252-46	51.9	
LT542	52.7	
(Mp339xTx601)S ₃	53.1	
Mp73:32	53.7	
Tx5855	56.3	
T240	57.3	
SC460	59.5	
Mp490	59.9	
LT636	60.7	
SC13R	61.8	
(GA209xTx601)S ₃	66.6	
SC13	67.0	
Tx601	67.3	
Ark. 346 SWC8	78.5	
SC473	78.8	
CI. 90C	81.7	
GA203	92.1	
Coefficient of variation	45.5	
Least significant difference	40.3	

^{1/} Duncan's Multiple Range Test - Entries with the same line in common are not considered significantly different at the 5% level.

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